

=> FIL REG
FILE 'REGISTRY' ENTERED AT 15:06:40 ON 28 OCT 2010
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=> D HIS NOFILE

FILE 'HCA' ENTERED AT 14:03:57 ON 28 OCT 2010
E US2007-584379/APPS
L1 1 SEA SPE=ON ABB=ON PLU=ON US2007-584379/AP
E EP2003-104985/APPS
L2 1 SEA SPE=ON ABB=ON PLU=ON EP2003-104985/PRN
E WO2004-EP53182/APPS
L3 1 SEA SPE=ON ABB=ON PLU=ON (WO2004-EP53182/AP OR
WO2004-EP53182/PRN)
L4 1 SEA SPE=ON ABB=ON PLU=ON (L1 OR L2 OR L3)
SEL L4 RN

FILE 'REGISTRY' ENTERED AT 14:05:00 ON 28 OCT 2010
L5 41 SEA SPE=ON ABB=ON PLU=ON (7439-93-2/BI OR 10034-81-8/B

FILE 'HCA' ENTERED AT 14:06:52 ON 28 OCT 2010
SEL L4 AU
L6 6 SEA SPE=ON ABB=ON PLU=ON ("BEST, ADAM SAMUEL"/AU OR
"LANDHEER, HISKE"/AU OR "OOMS, FRANCISCUS GUENTHERUS
BERNARDUS"/AU)
E SHELL OIL/CO
L7 24590 SEA SPE=ON ABB=ON PLU=ON ("SHELL OIL"+ALL/CO,CS,PA OR

FILE 'REGISTRY' ENTERED AT 14:09:57 ON 28 OCT 2010
E NC4/ES
L8 3578394 SEA SPE=ON ABB=ON PLU=ON NC4/ES
L9 14138 SEA SPE=ON ABB=ON PLU=ON ?PYRROLIDINIUM?/CNS
L10 13690 SEA SPE=ON ABB=ON PLU=ON L8 AND L9
L11 1362715 SEA SPE=ON ABB=ON PLU=ON PMS/CI
L12 13522 SEA SPE=ON ABB=ON PLU=ON L10 NOT L11

FILE 'HCA' ENTERED AT 14:13:38 ON 28 OCT 2010
L13 12667 SEA SPE=ON ABB=ON PLU=ON L12
L14 298034 SEA SPE=ON ABB=ON PLU=ON (BATTERY OR BATTERIES OR
(ELECTROCHEM? OR ELECTROLY? OR GALVANI? OR WET OR DRY OR
PRIMARY OR SECONDARY) (2A) (CELL OR CELLS) OR WETCELL? OR
DRYCELL?) /BI,AB
L15 302987 SEA SPE=ON ABB=ON PLU=ON ANOD#### OR NEG? (2A)
ELECTROD####
L16 311355 SEA SPE=ON ABB=ON PLU=ON CATHOD#### OR POS? (2A)
ELECTROD####
L17 50799 SEA SPE=ON ABB=ON PLU=ON ION### (2A) (LIQ# OR LIQUID?
OR FLUID?)
L18 79067 SEA SPE=ON ABB=ON PLU=ON L14 AND L15
L19 50076 SEA SPE=ON ABB=ON PLU=ON L18 AND L16
L20 284 SEA SPE=ON ABB=ON PLU=ON L19 AND L17
L21 37 SEA SPE=ON ABB=ON PLU=ON L20 AND L13
L22 114442 SEA SPE=ON ABB=ON PLU=ON L14 AND (L15 OR L16)
L23 470 SEA SPE=ON ABB=ON PLU=ON L22 AND L17
L24 68 SEA SPE=ON ABB=ON PLU=ON L23 AND L13
L25 557228 SEA SPE=ON ABB=ON PLU=ON ELECTROLY?
L26 35 SEA SPE=ON ABB=ON PLU=ON L21 AND L25

October 28, 2010

10/584,379

2

L27 62 SEA SPE=ON ABB=ON PLU=ON L24 AND L25

FILE 'REGISTRY' ENTERED AT 14:21:32 ON 28 OCT 2010
E C H F3 O3 S . LI/MF

L28 1 SEA SPE=ON ABB=ON PLU=ON "C H F3 O3 S . LI"/MF
L29 3338 SEA SPE=ON ABB=ON PLU=ON CHF3O3S
L30 77705 SEA SPE=ON ABB=ON PLU=ON F6P
L31 101 SEA SPE=ON ABB=ON PLU=ON C4B08
L32 187 SEA SPE=ON ABB=ON PLU=ON C4F906S3
L33 16041 SEA SPE=ON ABB=ON PLU=ON CLHO4
L34 107 SEA SPE=ON ABB=ON PLU=ON C2H7NO4S2
L35 2654 SEA SPE=ON ABB=ON PLU=ON ASF6
L36 42 SEA SPE=ON ABB=ON PLU=ON C4HF10NO4S2
L37 360 SEA SPE=ON ABB=ON PLU=ON C2HF6NO4S2
L38 19 SEA SPE=ON ABB=ON PLU=ON C2HF6N
L39 72229 SEA SPE=ON ABB=ON PLU=ON BF4
L40 172608 SEA SPE=ON ABB=ON PLU=ON (L28 OR L29 OR L30 OR L31 OR
L32 OR L33 OR L34 OR L35 OR L36 OR L37 OR L38 OR L39)

FILE 'HCA' ENTERED AT 14:31:43 ON 28 OCT 2010

L41 178507 SEA SPE=ON ABB=ON PLU=ON L40
L42 25 SEA SPE=ON ABB=ON PLU=ON L26 AND L41
L43 35 SEA SPE=ON ABB=ON PLU=ON L42 OR L26
L44 48 SEA SPE=ON ABB=ON PLU=ON L27 AND L41
L45 62 SEA SPE=ON ABB=ON PLU=ON L44 OR L27

FILE 'REGISTRY' ENTERED AT 14:37:44 ON 28 OCT 2010

E CL H O4 . 1/2 MG/MF

E CR LI O4 TI/MF

L46 1 SEA SPE=ON ABB=ON PLU=ON "CR LI O4 TI"/MF
E S2 TI/MF
L47 15 SEA SPE=ON ABB=ON PLU=ON "S2 TI"/MF
L48 1559 SEA SPE=ON ABB=ON PLU=ON (LI (L) FE (L) P (L) O)/ELS
L49 1092 SEA SPE=ON ABB=ON PLU=ON L48 AND O4P
L50 1108 SEA SPE=ON ABB=ON PLU=ON L46 OR L47 OR L49

FILE 'HCA' ENTERED AT 14:44:38 ON 28 OCT 2010

L51 2371 SEA SPE=ON ABB=ON PLU=ON L50
L52 1 SEA SPE=ON ABB=ON PLU=ON L43 AND L51
L53 35 SEA SPE=ON ABB=ON PLU=ON L52 OR L43
L54 1 SEA SPE=ON ABB=ON PLU=ON L45 AND L51
L55 62 SEA SPE=ON ABB=ON PLU=ON L54 OR L45

FILE 'REGISTRY' ENTERED AT 14:45:29 ON 28 OCT 2010

L56 7099 SEA SPE=ON ABB=ON PLU=ON (LI (L) TI (L) O)/ELS
L57 319 SEA SPE=ON ABB=ON PLU=ON L56 AND 3/ELC.SUB
L58 60 SEA SPE=ON ABB=ON PLU=ON L56 AND CR/ELS AND 4/ELC.SUB
L59 80 SEA SPE=ON ABB=ON PLU=ON L56 AND MG/ELS AND 4/ELC.SUB
L60 11945 SEA SPE=ON ABB=ON PLU=ON (LI (L) MN (L) O)/ELS
L61 960 SEA SPE=ON ABB=ON PLU=ON L60 AND 3/ELC.SUB
L62 16 SEA SPE=ON ABB=ON PLU=ON L61 AND 5/MN
L63 9 SEA SPE=ON ABB=ON PLU=ON L62 AND 12/O
L64 208 SEA SPE=ON ABB=ON PLU=ON L60 AND MG/ELS AND 4/ELC.SUB
L65 2 SEA SPE=ON ABB=ON PLU=ON L64 AND 5/MN
L66 1 SEA SPE=ON ABB=ON PLU=ON L65 AND 12/O

FILE 'HCA' ENTERED AT 14:57:06 ON 28 OCT 2010

L67 2867 SEA SPE=ON ABB=ON PLU=ON L57
L68 70 SEA SPE=ON ABB=ON PLU=ON L58
L69 68 SEA SPE=ON ABB=ON PLU=ON L59

L70	680	SEA	SPE=ON	ABB=ON	PLU=ON	L49
L71	223	SEA	SPE=ON	ABB=ON	PLU=ON	L63
L72	1	SEA	SPE=ON	ABB=ON	PLU=ON	L66
L73	2939	SEA	SPE=ON	ABB=ON	PLU=ON	L67 OR L68 OR L69
L74	33	SEA	SPE=ON	ABB=ON	PLU=ON	L70 AND (L69 OR L67)
L75	27	SEA	SPE=ON	ABB=ON	PLU=ON	(L71 OR L72) AND (L69 OR L67)
L76	4	SEA	SPE=ON	ABB=ON	PLU=ON	L53 AND L73
L77	1	SEA	SPE=ON	ABB=ON	PLU=ON	L53 AND L74
L78	1	SEA	SPE=ON	ABB=ON	PLU=ON	L53 AND L75
L79	35	SEA	SPE=ON	ABB=ON	PLU=ON	(L76 OR L77 OR L78) OR L53
L80	4	SEA	SPE=ON	ABB=ON	PLU=ON	L55 AND L73
L81	1	SEA	SPE=ON	ABB=ON	PLU=ON	L55 AND L74
L82	1	SEA	SPE=ON	ABB=ON	PLU=ON	L55 AND L75
L83	62	SEA	SPE=ON	ABB=ON	PLU=ON	(L80 OR L81 OR L82) OR L55
L84	62	SEA	SPE=ON	ABB=ON	PLU=ON	L79 OR L83
L85	2	SEA	SPE=ON	ABB=ON	PLU=ON	L84 AND (L6 OR L7)
L86	60	SEA	SPE=ON	ABB=ON	PLU=ON	L84 NOT L85
L87	4	SEA	SPE=ON	ABB=ON	PLU=ON	1802-2004/PY, PRY, AY AND L86
L88	56	SEA	SPE=ON	ABB=ON	PLU=ON	L86 NOT L87

SAV L88 WEI379/A

=> FIL HCA

FILE 'HCA' ENTERED AT 15:06:49 ON 28 OCT 2010

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=> D L85 1-2 IBIB ABS HITSTR HITIND RETABLE

L85	ANSWER 1 OF 2	HCA	COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER:	150:125209 HCA <u>Full-text</u>		
TITLE:	Lithium energy storage device		
INVENTOR(S):	Best, Adam Samuel; Hollenkamp, Anthony Frank; Bhatt, Anand Indravadan		
PATENT ASSIGNEE(S):	Commonwealth Scientific and Industrial Research Organisation, Australia		
SOURCE:	PCT Int. Appl., 51pp.		
DOCUMENT TYPE:	Patent		
LANGUAGE:	English		
FAMILY ACC. NUM. COUNT:	1		

PATENT INFORMATION:

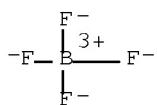
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2009003224	A1	20090108	WO 2008-AU950	200806
				27

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 BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE,
 EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN,
 IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT,
 LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
 NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK,
 SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
 VN, ZA, ZM, ZW

RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,
 HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE,
 SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
 NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ,
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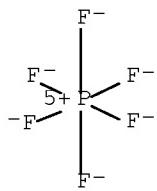
AU 2008271909	A1	20090108	AU 2008-271909	200806 27
CA 2691846	A1	20090108	CA 2008-2691846	200806 27
EP 2162942	A1	20100317	EP 2008-757027	200806 27
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, AL, BA, MK, RS				
KR 2010038400	A	20100414	KR 2010-7001801	200806 27
JP 2010532071	T	20100930	JP 2010-513581	200806 27
CN 101821892	A	20100901	CN 2008-80104536	201002 26
US 20100178555	A1	20100715	US 2010-667174	201003 01
PRIORITY APPLN. INFO.:			AU 2007-903507	A 200706 29
			WO 2008-AU950	W 200806 27

- AB A lithium energy storage device consists of at least one pos. electrode, at least one neg. electrode, and an ionic liquid electrolyte comprising bis(fluorosulfonyl)imide (FSI) as the anion and a cation counterion, and lithium ions at a level of >0.3 mol/kg of ionic liquid, and ≤1.5 mol/kg of ionic liquid. The lithium energy storage device can include an FSI ionic liquid electrolyte and LiBF4 or LiPF6 as the lithium salt. The pos. electrode is a lithium metal phosphate, in which the metal is a 1st-row transition metal, or a doped derivate thereof. Preferably, the pos. electrode is FeLiPO4.
- IT 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
 Lithium hexafluorophosphate (LiPF6) 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide 852620-97-4,
 1-Methyl-1-propylpyrrolidinium bis(fluorosulfonyl)imide (electrolyte; lithium energy storage device)
- RN 14283-07-9 HCA
- CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



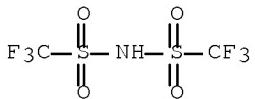
● Li⁺

RN 21324-40-3 HCA
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li⁺

RN 90076-65-6 HCA
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)

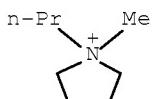


● Li

RN 852620-97-4 HCA
 CN Pyrrolidinium, 1-methyl-1-propyl-, salt with imidodisulfuryl fluoride (1:1) (CA INDEX NAME)

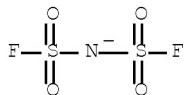
CM 1

CRN 108259-90-1
 CMF C8 H18 N



CM 2

CRN 44821-49-0
 CMF F2 N O4 S2



IPCI H01M0010-26 [I,A]; H01M0010-24 [I,A]; H01M0010-36 [I,A]; H01M0010-40 [I,A]
 IPCR H01M0010-24 [I,C]; H01M0010-26 [I,A]; H01M0004-58 [I,C*];
 H01M0004-58 [I,A]; H01M0010-24 [I,A]; H01M0010-36 [I,C*];
 H01M0010-36 [I,A]
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 ST secondary lithium battery ionic liq
 electrolyte metal phosphate cathode
 IT Ionic liquids
 (lithium energy storage device)
 IT Secondary batteries
 (lithium; lithium energy storage device)
 IT 15365-14-7, Iron lithium phosphate felipo4
 (cathode material; lithium energy storage device)
 IT 14203-07-9, Lithium tetrafluoroborate 21324-40-3,
 Lithium hexafluorophosphate (LiPF6) 90076-65-6, Lithium
 bis(trifluoromethanesulfonyl)imide 174899-83-3 235789-75-0,
 1-Ethyl-3-methylimidazolium bis(fluorosulfonyl)imide
 852620-97-4, 1-Methyl-1-propylpyrrolidinium
 bis(fluorosulfonyl)imide
 (electrolyte; lithium energy storage device)

RETABLE

Referenced	Author		Year		VOL		PG		Referenced Work		
Referenced	(RAU)		(RPY)		(RVL)		(RPG)		(RWK)		File
<hr/>											
Dai-Ichi Kogyo Seiyaku	2007			WO 2007088677 A1		HCA					
Herr, R	1995			US 5389467 A		HCA					
Mie, K	2004			US 20040106047 A1		HCA					

L85 ANSWER 2 OF 2 HCA COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 143:118081 HCA [Full-text](#)
 TITLE: Electrochemical element for use at high
 temperatures
 INVENTOR(S): Best, Adam Samuel; Landheer,
 Hiske; Ooms, Franciscus Guentherus
 Bernardus
 PATENT ASSIGNEE(S): Shell Internationale Research Maatschappij B.V.,
 Neth.; Shell Canada Limited
 SOURCE: PCT Int. Appl., 41 pp.
 CODEN: PIXXD2
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005064733	A1	20050714	WO 2004-EP53182	200411 30
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW	RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
AU 2004309904	A1	20050714	AU 2004-309904	200411 30
AU 2004309904	B2	20080403		
CA 2552230	A1	20050714	CA 2004-2552230	200411 30
GB 2424751	A	20061004	GB 2006-12515	200411 30
GB 2424751	B	20070606		
CN 1906795	A	20070131	CN 2004-80040707	200411 30
CN 100468856	C	20090311		
BR 2004018225	A	20070427	BR 2004-18225	200411 30
JP 2007517364	T	20070628	JP 2006-546146	200411 30
KR 2007001118	A	20070103	KR 2006-7015528	200607 31
US 20070254213	A1	20071101	US 2007-584379	200704 11
PRIORITY APPLN. INFO.:			EP 2003-104985	A 200312 29
			WO 2004-EP53182	W 200411 30

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

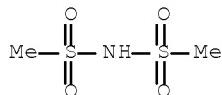
AB An electrochem. element for use at a high temperature has an anode, a cathode comprising an intercalation material having an upper reversible-potential-limit of at most 4 V vs. Li/Li⁺ as active material, and an electrolyte arranged between the cathode and anode, which electrolyte comprises an ionic liquid with an anion and a cation comprising a pyrrolidinium ring structure

having four C atoms and one N atom. Expts. revealed that rechargeable batteries comprising such an intercalation material and N-R1-N-R2-pyrrolidinium, wherein R1 and R2 are alkyl groups and R1 may be Me and R2 may be Bu or hexyl, are particularly suitable for use at a temperature of up to about 150° and may be used in oil and/or gas production wells.

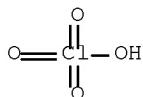
- IT 371-77-7D, compound 5347-82-0D, compound
 7791-03-9, Lithium perchlorate 10034-81-8,
 Magnesium perchlorate 12017-97-9, Chromium lithium
 titanium oxide (CrLiTiO₄) 12031-92-4, Lithium manganese
 oxide (Li₄MnO₁₂) 12031-95-7, Lithium titanium oxide
 (Li₄Ti₅O₁₂) 12039-13-3, Titanium sulfide (TiS₂)
 14263-07-9, Lithium tetrafluoroborate 14874-70-5D,
 Tetrafluoroborate, compound 16919-18-9D,
 Hexafluorophosphate, compound 16973-45-8D,
 Hexafluoroarsenate, compound 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium triflate 37217-08-6, Lithium
 titanium oxide (LiTi₂O₄) 55526-39-1D, Pyrrolidinium,
 compound 82113-65-3D, compound 90076-65-6
 125579-65-9D, compound 130447-45-9D, compound
 132404-42-3 152894-10-5D, compound
 180984-63-8, Lithium magnesium titanium oxide
 223437-10-3D, 1-Butyl-1-methylPyrrolidinium, compound
 244761-29-3, Lithium bis(oxalato)borate 330671-30-2D
 , compound 857631-30-2, Lithium magnesium titanium oxide
 (Li₃-4MgO-1Ti₅O₁₂) 857631-31-3, Lithium magnesium
 manganese oxide (Li₃-4MgO-1MnO₁₂) 857631-32-4, Iron
 lithium magnesium phosphate (FeLi_{0.98}-1MgO-0.02(PO₄))
 857631-33-5, Iron lithium niobium phosphate
 (FeLi_{0.98}-1NbO-0.02(PO₄)) 857631-34-6, Iron lithium
 zirconium phosphate (FeLi_{0.98}-1ZrO-0.02(PO₄)) 857631-35-7,
 Iron lithium titanium phosphate (FeLi_{0.98}-1TiO-0.02(PO₄))
 857631-36-8, Aluminum iron lithium phosphate
 (Al₁₀-0.02FeLi_{0.98}-1(PO₄))
 (electrochem. element for use at high temps.)
- RN 371-77-7 HCA
- CN Methanamine, 1,1,1-trifluoro-N-(trifluoromethyl)- (CA INDEX NAME)



- RN 5347-82-0 HCA
- CN Methanesulfonamide, N-(methylsulfonyl)- (CA INDEX NAME)

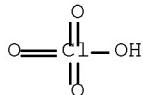


- RN 7791-03-9 HCA
- CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 10034-81-8 HCA
 CN Perchloric acid, magnesium salt (2:1) (CA INDEX NAME)



● 1/2 Mg

RN 12017-97-9 HCA
 CN Chromium lithium titanium oxide (CrLiTiO₄) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
<hr/>		
O	4	17778-80-2
Cr	1	7440-47-3
Ti	1	7440-32-6
Li	1	7439-93-2

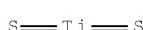
RN 12031-92-4 HCA
 CN Lithium manganese oxide (Li₄Mn₅O₁₂) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
<hr/>		
O	12	17778-80-2
Mn	5	7439-96-5
Li	4	7439-93-2

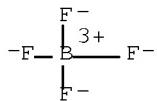
RN 12031-95-7 HCA
 CN Lithium titanium oxide (Li₄Ti₅O₁₂) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
<hr/>		
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

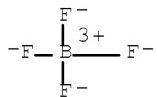
RN 12039-13-3 HCA
 CN Titanium sulfide (TiS₂) (CA INDEX NAME)



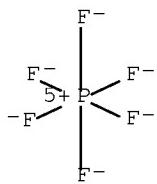
RN 14283-07-9 HCA
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



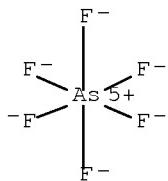
RN 14874-70-5 HCA
 CN Borate(1-), tetrafluoro- (CA INDEX NAME)



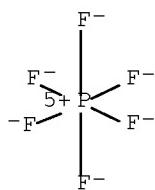
RN 16919-18-9 HCA
 CN Phosphate(1-), hexafluoro- (CA INDEX NAME)



RN 16973-45-8 HCA
 CN Arsenate(1-), hexafluoro- (CA INDEX NAME)

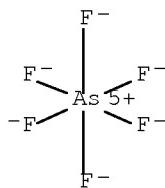


RN 21324-40-3 HCA
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



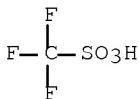
● Li⁺

RN 29935-35-1 HCA
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li⁺

RN 33454-82-9 HCA
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 37217-08-6 HCA
 CN Lithium titanium oxide (LiTi₂O₄) (CA INDEX NAME)

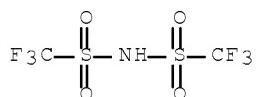
Component	Ratio	Component	Registry Number
O	4		17778-80-2
Ti	2		7440-32-6
Li	1		7439-93-2

RN 55526-39-1 HCA
 CN Pyrrolidine, conjugate acid (1:1) (CA INDEX NAME)

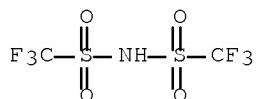


● H⁺

RN 82113-65-3 HCA
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
 (CA INDEX NAME)

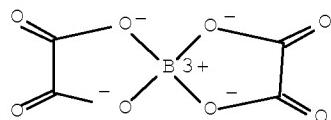


RN 90076-65-6 HCA
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-,
 lithium salt (1:1) (CA INDEX NAME)

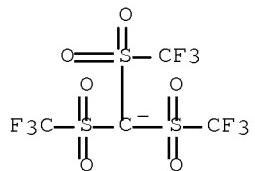


● Li

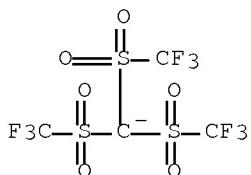
RN 125579-65-9 HCA
 CN Borate(1-), bis[ethanedioato(2-)–κO1,κO2]–, (T-4)– (9CI)
 (CA INDEX NAME)



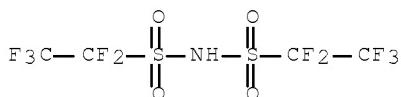
RN 130447-45-9 HCA
 CN Methane, tris[(trifluoromethyl)sulfonyl]–, ion(1–) (CA INDEX NAME)



RN 132404-42-3 HCA
CN Methane, tris[(trifluoromethyl)sulfonyl]-, ion(1-), lithium (1:1)
(CA INDEX NAME)



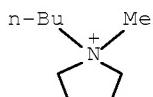
RN 152894-10-5 HCA
CN Ethanesulfonamide, 1,1,2,2,2-pentafluoro-N-[(1,1,2,2,2-pentafluoroethyl)sulfonyl]- (CA INDEX NAME)



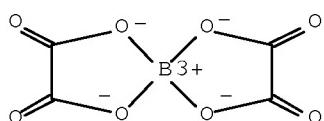
RN 180984-63-8 HCA
CN Lithium magnesium titanium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Ti	x	7440-32-6
Mg	x	7439-95-4
Li	x	7439-93-2

RN 223437-10-3 HCA
CN Pyrrolidinium, 1-butyl-1-methyl- (CA INDEX NAME)

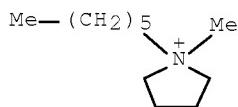


RN 244761-29-3 HCA
CN Borate(1-), bis[ethanedioato(2-)-κO1,κO2]-, lithium
(1:1), (T-4)- (CA INDEX NAME)



● Li⁺

RN 330671-30-2 HCA
 CN Pyrrolidinium, 1-hexyl-1-methyl- (CA INDEX NAME)



RN 857631-30-2 HCA
 CN Lithium magnesium titanium oxide (Li₃-4Mg₀-1Ti₅O₁₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	12	17778-80-2
Ti	5	7440-32-6
Mg	0 - 1	7439-95-4
Li	3 - 4	7439-93-2

RN 857631-31-3 HCA
 CN Lithium magnesium manganese oxide (Li₃-4Mg₀-1Mn₅O₁₂) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	12	17778-80-2
Mn	5	7439-96-5
Mg	0 - 1	7439-95-4
Li	3 - 4	7439-93-2

RN 857631-32-4 HCA
 CN Iron lithium magnesium phosphate (FeLi_{0.98}-1Mg₀-0.02(PO₄)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O ₄ P	1	14265-44-2
Mg	0 - 0.02	7439-95-4
Li	0.98 - 1	7439-93-2
Fe	1	7439-89-6

RN 857631-33-5 HCA
 CN Iron lithium niobium phosphate (FeLi_{0.98}-1Nb₀-0.02(PO₄)) (CA INDEX

NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Nb	0 - 0.02	7440-03-1
Li	0.98 - 1	7439-93-2
Fe	1	7439-89-6

RN 857631-34-6 HCA

CN Iron lithium zirconium phosphate (FeLi0.98-1Zr0-0.02(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Zr	0 - 0.02	7440-67-7
Li	0.98 - 1	7439-93-2
Fe	1	7439-89-6

RN 857631-35-7 HCA

CN Iron lithium titanium phosphate (FeLi0.98-1Ti0-0.02(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Ti	0 - 0.02	7440-32-6
Li	0.98 - 1	7439-93-2
Fe	1	7439-89-6

RN 857631-36-8 HCA

CN Aluminum iron lithium phosphate (Al0-0.02FeLi0.98-1(PO4)) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O4P	1	14265-44-2
Li	0.98 - 1	7439-93-2
Fe	1	7439-89-6
Al	0 - 0.02	7429-90-5

IPCI H01M0010-40 [ICM,7]; H01M0010-39 [ICS,7]; H01M0010-36 [ICS,7];
H01M0006-14 [ICS,7]; H01M0006-16 [ICS,7]; H01G0009-02 [ICS,7]IPCR H01G0009-02 [I,C*]; H01G0009-02 [I,A]; H01G0009-022 [I,C*];
H01G0009-022 [I,A]; H01M0004-48 [N,C*]; H01M0004-48 [N,A];
H01M0004-58 [N,C*]; H01M0004-58 [N,A]; H01M0006-14 [I,C*];
H01M0006-14 [I,A]; H01M0006-16 [I,C*]; H01M0006-16 [I,A];
H01M0010-36 [I,C*]; H01M0010-36 [I,A]; H01M0010-39 [I,A]CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 51, 72, 76

ST battery high temp use oil gas well

IT Electrolytic capacitors

Geothermal wells

Ionic liquids

Natural gas wells

Oil wells
 Primary batteries
 Secondary batteries
 (electrochem. element for use at high temps.)
 IT 371-77-7D, compound 1314-62-1, Vanadium oxide (V2O5), uses
 5347-82-0D, compound 7439-93-2, Lithium, uses 7439-93-2D,
 Lithium, salt 7791-03-9, Lithium perchlorate
 10034-81-8, Magnesium perchlorate 12017-97-9,
 Chromium lithium titanium oxide (CrLiTiO4) 12031-92-4,
 Lithium manganese oxide (Li4Mn5O12) 12031-95-7, Lithium
 titanium oxide (Li4Ti5O12) 12039-13-3, Titanium sulfide
 (TiS2) 14283-07-9, Lithium tetrafluoroborate
 14797-73-0D, Perchlorate, compound 14874-70-5D,
 Tetrafluoroborate, compound 16919-18-9D,
 Hexafluorophosphate, compound 16973-45-9D,
 Hexafluoroarsenate, compound 21324-40-3, Lithium
 hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate
 33454-82-9, Lithium triflate 37181-39-8D, Triflate, compound
 37217-08-6, Lithium titanium oxide (LiTi2O4)
 55526-39-1D, Pyrrolidinium, compound 82113-65-3D,
 compound 90076-65-6 125579-65-9D, compound
 130447-45-9D, compound 132404-42-3
 152894-10-5D, compound 175786-46-6, Lithium magnesium
 manganese oxide 180984-63-8, Lithium magnesium titanium
 oxide 223437-10-3D, 1-Butyl-1-methylPyrrolidinium, compound
 244761-29-3, Lithium bis(oxalato)borate 330671-30-2D
 , compound 857631-30-2, Lithium magnesium titanium oxide
 (Li3-4Mg0-1Ti5O12) 857631-31-3, Lithium magnesium
 manganese oxide (Li3-4Mg0-1Mn5O12) 857631-32-4, Iron
 lithium magnesium phosphate (FeLi0.98-1Mg0-0.02(PO4))
 857631-33-5, Iron lithium niobium phosphate
 (FeLi0.98-1Nb0-0.02(PO4)) 857631-34-6, Iron lithium
 zirconium phosphate (FeLi0.98-1Zr0-0.02(PO4)) 857631-35-7,
 Iron lithium titanium phosphate (FeLi0.98-1Ti0-0.02(PO4))
 857631-36-8, Aluminum iron lithium phosphate
 (Al0-0.02FeLi0.98-1(PO4))
 (electrochem. element for use at high temps.)

RETABLE

Referenced	Author	Year VOL PG	Referenced Work	
Referenced	(RAU)	(R PY) (R VL) (R PG)	(R WK)	File
<hr/>				
Macfarlane, D		2001	WO 0115258 A	HCA
Macfarlane, D		1999	4164 JOURNAL OF PHYSICAL	HCA
Michot, C		2002	US 2002055045 A1	HCA
OS.CITING REF COUNT:	2	THERE ARE 2 CAPLUS RECORDS THAT CITE THIS		
		RECORD (2 CITINGS)		

=> D L87 1-4 IBIB ABS HITSTR HITIND RETABLE

L87 ANSWER 1 OF 4 HCA COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 145:317982 HCA Full-text
 TITLE: Nonaqueous electrolyte secondary
 battery
 INVENTOR(S): Ohzuku, Tsutomu; Yoshizawa, Hiroshi; Nakura,
 Kensuke
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan;
 Osaka City University

SOURCE: U.S. Pat. Appl. Publ., 30 pp., Cont.-in-part of
 U.S. Ser. No. 979,764.
 CODEN: USXXCO

DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 2
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20060204847	A1	20060914	US 2006-430994	200605 10
JP 2005142047	A	20050602	JP 2003-377954	200311 07
JP 4554911	B2	20100929		<--
US 20050147889	A1	20050707	US 2004-979764	200411 03
US 7722989	B2	20100525		<--
KR 2006113872	A	20061103	KR 2006-100852	200610 17
KR 899504	B1	20090526	JP 2003-377954	A 200311 07
PRIORITY APPLN. INFO.:				
			US 2004-979764	A2 200411 03
			KR 2004-89762	A3 200411 05
				<--

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB As an alternative technique to lead-acid batteries, the present invention provides an inexpensive 2 V nonaq. electrolyte secondary battery having excellent cycle life at a high rate by preventing volume change during charge and discharge. The nonaq. electrolyte secondary battery uses: a pos. electrode active material having a layered structure, being represented by chemical formula $\text{Li}_{1+\alpha}[\text{Me}]O_2$, where $0 \leq \alpha < 0.2$, and Me is a transition metal including Ni and at least one selected from the group consisting of Mn, Fe, Co, Ti and Cu, and including elemental nickel and elemental cobalt in substantially the same ratio; and a neg. electrode active material including $\text{Li}_4\text{Ti}_5\text{O}_12$.

IT 12031-95-7, Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_12$)
 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
 Lithium hexafluorophosphate

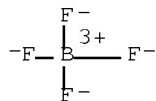
(nonaq. electrolyte secondary battery)

RN 12031-95-7 HCA

CN Lithium titanium oxide ($\text{Li}_4\text{Ti}_5\text{O}_12$) (CA INDEX NAME)

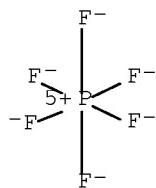
Component	Ratio	Component Registry Number
O	12	17778-80-2
Ti	5	7440-32-6
Li	4	7439-93-2

RN 14283-07-9 HCA
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



● Li⁺

RN 21324-40-3 HCA
CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



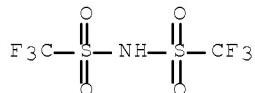
● Li⁺

IT 55526-39-1, Pyrrolidinium 82113-65-3
(nonaq. electrolyte secondary battery)
RN 55526-39-1 HCA
CN Pyrrolidine, conjugate acid (1:1) (CA INDEX NAME)



● H⁺

RN 82113-65-3 HCA
CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-
(CA INDEX NAME)



INCL 429223000; 429231100; 429221000; 429231300; 429220000; 429231500;
 429224000; 429339000; 429337000; 429338000; 429340000; 429200000;
 429342000; 429341000

IPCI H01M0004-52 [I,A]; H01M0004-50 [I,A]; H01M0010-40 [I,A]; H01M0010-36
 [I,C*]

IPCR H01M0004-52 [I,C]; H01M0004-52 [I,A]; H01M0004-66 [I,C*];
 H01M0004-66 [I,A]; H01M0002-16 [I,C*]; H01M0002-16 [I,A];
 H01M0004-02 [I,C*]; H01M0004-02 [I,A]; H01M0004-48 [I,C*];
 H01M0004-48 [I,A]; H01M0004-50 [I,C]; H01M0004-50 [I,A]; H01M0004-58
 [I,C*]; H01M0004-58 [I,A]; H01M0010-36 [I,C]; H01M0010-38 [I,A];
 H01M0010-40 [I,A]

NCL 429/223.000; 429/200.000; 429/220.000; 429/221.000; 429/224.000;
 429/231.100; 429/231.300; 429/231.500; 429/337.000; 429/338.000;
 429/339.000; 429/340.000; 429/341.000; 429/342.000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
 Section cross-reference(s): 49

ST nonaq electrolyte secondary battery

IT Polyamide fibers
 (aramid; nonaq. electrolyte secondary battery
)

IT Battery cathodes
 Ionic liquids
 Nonwoven fabrics
 Secondary batteries
 Secondary battery separators
 (nonaq. electrolyte secondary battery)

IT Polyamide fibers
 Polyesters
 Vinal fibers
 (nonaq. electrolyte secondary battery)

IT Amides
 (nonaq. electrolyte secondary battery)

IT Halides
 (nonaq. electrolyte secondary battery)

IT Imides
 (nonaq. electrolyte secondary battery)

IT Sulfonic acids
 (salts; nonaq. electrolyte secondary battery)

IT Aluminum alloy, base
 (nonaq. electrolyte secondary battery)

IT 75-05-8, Acetonitrile, uses 78-40-0, Triethyl phosphate 96-48-0,
 γ -Butyrolactone 96-49-1, Ethylene carbonate 96-49-1D,
 Ethylene carbonate, fluorinated 108-29-2, γ -Valerolactone
 108-32-7, Propylene carbonate 111-96-6, Methyldiglyme 126-33-0,
 Sulfolane 512-56-1, Trimethyl phosphate 7429-90-5, Aluminum,
 uses 7440-50-8, Copper, uses 9002-88-4, Polyethylene
 9003-07-0, Polypropylene 12031-95-7, Lithium titanium
 oxide (Li₄Ti₅O₁₂) 13463-67-7, Titanium oxide, uses
 14283-07-9, Lithium tetrafluoroborate 21324-40-3,
 Lithium hexafluorophosphate 24968-12-5, Polybutylene terephthalate
 25038-59-9, uses 35466-86-5 131344-56-4, Cobalt lithium nickel

oxide 909034-11-3, Cobalt lithium nickel oxide
 (Co0.5Li0.9-1.1Ni0.502) 909034-12-4, Cobalt lithium nickel oxide
 (Co0.33Li0.9-1.1Ni0.3302)
 (nonaq. electrolyte secondary battery)

IT 74-84-0, Ethane, uses 3398-75-2, Decanoate 11129-12-7, Borate
 14265-44-2, Phosphate, uses 14798-03-9, Ammonium, uses
 14808-79-8, Sulfate, uses 16749-13-6, Phosphonium 16969-45-2,
 Pyridinium 17009-90-4, Imidazolium 20064-29-3,
 Trimethylpropylammonium 25215-10-5, Guanidinium 37264-96-3,
 Cobalt carbonyl 39349-74-1, Antimonate 55526-39-1,
 Pyrrolidinium 65039-03-4, 1-Ethyl-3-methylimidazolium
 82113-68-3

(nonaq. electrolyte secondary battery)

OS.CITING REF COUNT: 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS
 RECORD (7 CITINGS)

L87 ANSWER 2 OF 4 HCA COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 140:382217 HCA Full-text
 TITLE: Investigation of ionic liquids
 as electrolytes for carbon nanotube
 electrodes
 AUTHOR(S): Barisci, J. N.; Wallace, G. G.; MacFarlane, D.
 R.; Baughman, R. H.
 CORPORATE SOURCE: Department of Chemistry, University of
 Wollongong, Wollongong, 2522, Australia
 SOURCE: Electrochemistry Communications (2004
), 6(1), 22-27
 CODEN: ECCMF9; ISSN: 1388-2481
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB The use of ionic liqs. (IL) as
 electrolytes for electrochem. applications involving carbon nanotube (CNT)
 electrodes has been investigated in a brief initial study. The use of IL
 electrolytes in conjunction with CNT electrodes has proved possible and
 advantageous. Ionic liqs. provide relatively high conductivity, wide potential
 window (up to 5.5 V) along with chemical stability and nonvolatile nature.
 While some decrease in the electrode capacitance and charging rate are
 observed in IL with respect to conventional electrolytes, the magnitude of the
 decrease is not substantial. The general well defined electrochem. behavior
 of CNT electrodes in IL, coupled to the wide potential window and other
 advantages of these electrolytes, suggest new avenues for the design of
 capacitors, batteries and electromech. actuators.

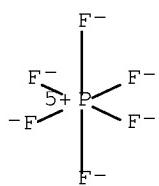
IT 3109-63-5, Tetrabutylammonium hexafluorophosphate
 174501-64-5 223437-05-6
 (electrolytes for carbon nanotube electrodes)

RN 3109-63-5 HCA

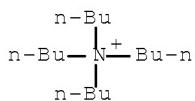
CN 1-Butanaminium, N,N,N-tributyl-, hexafluorophosphate(1-) (1:1) (CA
 INDEX NAME)

CM 1

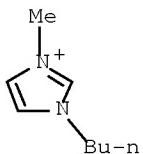
CRN 16919-18-9
 CMF F6 P
 CCI CCS



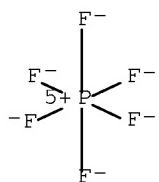
CM 2

CRN 10549-76-5
CMF C16 H36 NRN 174501-64-5 HCA
CN 1H-Imidazolium, 3-butyl-1-methyl-, hexafluorophosphate(1-) (1:1)
(CA INDEX NAME)

CM 1

CRN 80432-08-2
CMF C8 H15 N2

CM 2

CRN 16919-18-9
CMF F6 P
CCI CCS

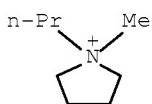
RN 223437-05-6 HCA

CN Pyrrolidinium, 1-methyl-1-propyl-, salt with
1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulfonamide
(1:1) (CA INDEX NAME)

CM 1

CRN 108259-90-1

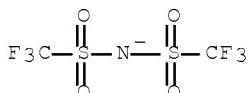
CMF C8 H18 N



CM 2

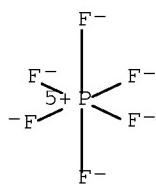
CRN 98837-98-0

CMF C2 F6 N O4 S2

IT 16919-18-9, Hexafluorophosphate
(ionic liquid containing; ionic
liqs. as electrolytes for carbon nanotube
electrodes)

RN 16919-18-9 HCA

CN Phosphate(1-), hexafluoro- (CA INDEX NAME)



CC 72-2 (Electrochemistry)

ST carbon nanotube electrode ionic liq
electrolyte; cond potential window chem stability
electrolyte electrodeIT Ionic liquids
(as electrolytes for carbon nanotube electrodes)IT Nanotubes
(carbon; ionic liqs. as electrolytes
for carbon nanotube electrodes)

IT Stability
 (chemical stability; of electrolytes for carbon nanotube electrodes)

IT Electrodes
 Electrolytes
 (ionic liqs. as electrolytes for carbon nanotube electrodes)

IT Cyclic voltammetry
 Electric capacitance-potential relationship
 Electric impedance
 (of carbon nanotubes in ionic liquid)

IT Electric conductivity
 (of electrolytes for carbon nanotube electrodes)

IT Electric potential
 (potential window; of electrolytes for carbon nanotube electrodes)

IT 3109-63-5, Tetrabutylammonium hexafluorophosphate
 174501-64-5 174899-82-2 223437-05-6
 370865-89-7, 1-Ethyl-3-methylimidazolium dicyanamide
 (electrolytes for carbon nanotube electrodes)

IT 123-75-1D, Pyrrolidine, derivs. 288-32-4D, Imidazole, derivs.
 16722-51-3, p-Toluenesulfonate, uses 16919-18-9,
 Hexafluorophosphate 17997-40-9 98837-98-0
 (ionic liquid containing; ionic liqs. as electrolytes for carbon nanotube electrodes)

IT 7440-44-0, Carbon, uses
 (nanotubes; ionic liqs. as electrolytes for carbon nanotube electrodes)

RETABLE

Referenced Author Referenced (RAU)	Year VOL PG	Referenced Work (RPY) (RVL) (RPG) (RWK) File		
<hr/>				
An, K	2001 13 497	Adv Mat HCA		
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Britto, P	1996 41 121	Bioelectrochem Bioen HCA		
Campbell, J	1999 121 3779	J Am Chem Soc HCA		
Che, G	1998 393 346	Nature HCA		
Gao, M		Electroanalysis, in		
Gerisher, H	1987 91 1930	J Phys Chem		
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Li, J	2002 106 9299	J Phys Chem B HCA		
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Minett, A	2002 2 61	Curr App Phys		
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Papageorgiou, N	1996 143 3099	J Electrochem Soc HCA		
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 Sun, J | 1998 | 102 | 8858 | J Phys Chem B | HCA
 Wang, J | 2002 | 74 | 1993 | Anal Chem | HCA
 OS.CITING REF COUNT: 106 THERE ARE 106 CAPLUS RECORDS THAT CITE
 THIS RECORD (106 CITINGS)

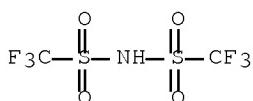
L87 ANSWER 3 OF 4 HCA COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 139:294470 HCA Full-text
 TITLE: N-Methyl-N-propylpiperidinium
 bis(trifluoromethanesulfonyl)imide (PP13-TFSI) -
 novel electrolyte base for Li
 battery
 AUTHOR(S): Sakaebe, Hikari; Matsumoto, Hajime
 CORPORATE SOURCE: Special Division of Green Life Technology,
 National Institute of Advanced Industrial
 Science and Technology (AIST), Ikeda, Osaka,
 563-8577, Japan
 SOURCE: Electrochemistry Communications (2003
), 5(7), 594-598
 CODEN: ECCMF9; ISSN: 1388-2481
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB A few room temperature ionic liqs. containing quaternary ammonium cation and imide anion were prepared and electrochem. evaluated and compared to the conventional room temperature ionic liquid system with 1-ethyl-3-methylimidazolium cation. Ability for use as an electrolyte base of s lithium battery system was totally explained with the cathodic stability of the salt, however, other properties might also affect this ability. Among the salts studied here, N-methyl-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide is the most promising candidate as the electrolyte base. Li/LiCoO₂ cell containing the salt showed very good performance with a consistent capacity of LiCoO₂ and the Coulombic efficiency at entire cycles of >97% at C/10 current rate. When cycled at higher rate (C/2), 85% of the discharge capacity was still retained.

IT 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
 (N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide
 (PP13-TFSI) - novel electrolyte base for Li secondary
 battery)

RN 90076-65-6 HCA

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IT 223437-05-6P
 (N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide
 (PP13-TFSI) - novel electrolyte base for Li secondary
 battery)

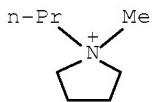
RN 223437-05-6 HCA

CN Pyrrolidinium, 1-methyl-1-propyl-, salt with

1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulfonamide
(1:1) (CA INDEX NAME)

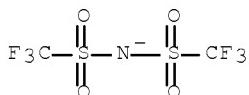
CM 1

CRN 108259-90-1
CMF C8 H18 N

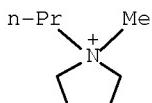


CM 2

CRN 98837-98-0
CMF C2 F6 N O4 S2



IT 608140-09-6P, N-Methyl-N-propylpyrrolidinium bromide
(P13; N-Me-N-propylpiperidinium
bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel
electrolyte base for Li secondary battery)
RN 608140-09-6 HCA
CN Pyrrolidinium, 1-methyl-1-propyl-, bromide (1:1) (CA INDEX NAME)



● Br-

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST dialkyl piperidinium trifluoromethanesulfonyl imide pyrrolidinium
quaternary ammonium electrolyte battery; lithium
secondary batter electrolyte ionic liq
LiTFSI quaternary ammonium
IT Battery electrolytes
Ionic conductivity
Ionic liquids
Linear-sweep voltammetry
(N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide

- (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Carbon black, uses
(composite with LiCoO₂ and KF 1120; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Fluoropolymers, uses
(composite with acetylene black and LiCoO₂; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Electrodes
(glassy carbon; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Current density
(limiting; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Secondary batteries
(lithium; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT Electric energy
(specific and discharge capacity curves; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 7429-90-5, Aluminum, uses 7439-93-2, Lithium, uses 7440-06-4, Platinum, uses 174899-82-2, 1H-Imidazolium, 1-ethyl-3-methyl-, salt with 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulfonamide (1:1)
(N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 90076-65-6, Lithium bis(trifluoromethanesulfonyl)imide
(N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 223437-05-6P 268536-05-6P 608140-12-1P,
N-Methyl-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide
(N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 106-94-5, Propyl bromide
(N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 120-94-5, 1-Methylpyrrolidine
(P13 precursor; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 608140-09-6P, N-Methyl-N-propylpyrrolidinium bromide
(P13; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)
- IT 626-67-5, N-Methylpiperidine
(PP13 precursor; N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel electrolyte base for Li secondary battery)

- IT 88840-42-0P
 (PP13; N-Me-N-propylpiperidinium
 bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel
 electrolyte base for Li secondary battery)
- IT 75-50-3, Trimethylamine, reactions
 (TMPA precursor; N-Me-N-propylpiperidinium
 bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel
 electrolyte base for Li secondary battery)
- IT 2650-50-2P
 (TMPA; N-Me-N-propylpiperidinium
 bis(trifluoromethanesulfonyl)imide (PP13-TFSI) - novel
 electrolyte base for Li secondary battery)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO₂)
 (composite with acetylene black and KF 1120;
 N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide
 (PP13-TFSI) - novel electrolyte base for Li secondary
 battery)
- IT 24937-79-9, KF 1120
 (composite with acetylene black and LiCoO₂;
 N-Me-N-propylpiperidinium bis(trifluoromethanesulfonyl)imide
 (PP13-TFSI) - novel electrolyte base for Li secondary
 battery)

RETABLE

Referenced Author Referenced (RAU)	Year VOL PG Referenced Work (R PY) (R VL) (R PG) (RWK) File							
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Caja, J	2000 150 Molten Salts XII HCA							
Fuller, J	1997 144 3881 J Electrochem Soc HCA							
Fung, Y	1999 81 891 J Power Sources							
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MacFarlane, D	1999 103 4164 J Phys Chem B HCA							
Matsuda, T	2002 70 446 Electrochemistry HCA							
Matsumoto, H	2000 922 Chem Lett HCA							
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Matsumoto, H	2000 186 Molten salts XII HCA							
Nagaura, T	1991 9 209 Prog Batt Solar Cell							
Papageorgiou, N	1996 143 3099 J Electrochem Soc							
OS.CITING REF COUNT:	273 THERE ARE 273 CAPLUS RECORDS THAT CITE THIS RECORD (278 CITINGS)							

L87 ANSWER 4 OF 4 HCA COPYRIGHT 2010 ACS on STN
 ACCESSION NUMBER: 138:408292 HCA Full-text
 TITLE: Electrochemical process for producing
 ionic liquids
 INVENTOR(S): Moulton, Roger
 PATENT ASSIGNEE(S): Sachem, Inc., USA
 SOURCE: U.S. Pat. Appl. Publ., 8 pp.
 CODEN: USXXCO
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20030094380	A1	20030522	US 2001-990651	

October 28, 2010

10/584,379

28

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US 6991718	B2	20060131		
CA 2467461	A1	20030605	CA 2002-2467461	200211
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WO 2003046257	A1	20030605	WO 2002-US36907	200211
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RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2002365547	A1	20030610	AU 2002-365547	200211
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AU 2002365547	B2	20070705		
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CN 1630737	A	20050622	CN 2002-825144	200211
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CN 100366799	C	20080206		
JP 2005529232	T	20050929	JP 2003-547683	200211
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IL 162061	A	20070308	IL 2002-162061	200211
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KR 965020	B1	20100621	KR 2004-7007671	200211
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TW 255205	B	20060521	TW 2002-133940	200211
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ZA 2004003819	A	20051004	ZA 2004-3819	200405
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IN 2004CN01109	A	20060203	IN 2004-CN1109	

200405
18

PRIORITY APPLN. INFO.:

US 2001-990651

A

200111
21

WO 2002-US36907

W

200211
18

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ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention relates to an electrochem. process for producing ionic liqs. The ionic liqs. may be hydrophilic or hydrophobic ionic liqs. The ionic liqs. are made by subjecting an electrochem. cell to electrolysis.

IT 327022-59-3, N-Methyl-N-propylpyrrolidinium tetrafluoroborate
(electrochem. process for producing ionic liqs
.)

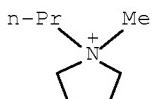
RN 327022-59-3 HCA

CN Pyrrolidinium, 1-methyl-1-propyl-, tetrafluoroborate(1-) (1:1) (CA INDEX NAME)

CM 1

CRN 108259-90-1

CMF C8 H18 N

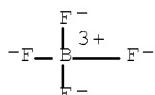


CM 2

CRN 14874-70-5

CMF B F4

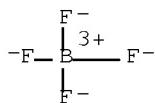
CCI CCS



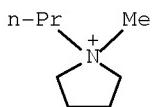
IT 16872-11-0, Tetrafluoroboric acid S28818-82-8,
N-Methyl-N-propylpyrrolidinium chloride
(use in electrochem. process for producing ionic
liqs.)

RN 16872-11-0 HCA

CN Borate(1-), tetrafluoro-, hydrogen (1:1) (CA INDEX NAME)



RN 528818-82-8 HCA
 CN Pyrrolidinium, 1-methyl-1-propyl-, chloride (1:1) (CA INDEX NAME)



INCL 205431000; X20-555.1; X20-453.7; X20-453.8
 IPCI C25B0003-00 [I,A]
 IPCR B01D0061-42 [I,C*]; B01D0061-44 [I,A]; C25B0001-00 [I,C*];
 C25B0001-00 [I,A]; C25B0003-00 [I,C*]; C25B0003-00 [I,A]
 NCL 205/431.000; 204/537.000; 204/538.000; 205/551.000; 205/413.000;
 205/444.000
 CC 72-9 (Electrochemistry)
 Section cross-reference(s): 28, 48
 ST electrochem producing ionic liq
 IT Membranes, nonbiological
 (bipolar; electrochem. process for producing ionic
 liqs. using)
 IT Anodes
 (dimensionally stable anodes; electrochem. process for
 producing ionic liqs. in electrolyzer
 with)
 IT Ionic liquids
 (electrochem. process for producing)
 IT Electrolysis
 (electrochem. process for producing ionic liqs
 .)
 IT Anion exchange membranes
 Cation exchange membranes
 (electrochem. process for producing ionic liqs
 . using)
 IT 12645-46-4, Iridium oxide
 (anode in electrolyzer electrochem. process
 for producing ionic liqs.)
 IT 7440-02-0, Nickel, uses
 (cathode in electrolyzer in electrochem.
 process for producing ionic liqs.)
 IT 7580-37-2, Tetrakis(hydroxymethyl)phosphonium acetate 179075-88-8,
 1-Butyl-3-methylimidazolium nitrate 284049-75-8,
 1-Butyl-3-methylimidazolium acetate 327022-59-3,

N-Methyl-N-propylpyrrolidinium tetrafluoroborate 478935-31-8,
 1-Butyl-3-methylimidazolium dihydrogenphosphate 528818-84-0
 528818-85-1
 (electrochem. process for producing ionic liqs
 .)
 IT 203389-24-6, 1-Butylpyridinium nitrate 497144-87-3,
 1-Butyl-3-methylimidazolium formate
 (electrochem. process for producing ionic liqs
 .)
 IT 66796-30-3, Nafion 117 100754-08-3, Nafion 902
 (electrochem. process for producing ionic liqs
 . using)
 IT 64-19-7, Acetic acid, reactions 124-38-9, Carbon dioxide,
 reactions 124-64-1, Tetrakis(hydroxymethyl)phosphonium chloride
 1124-64-7, n-Butylpyridinium chloride 1310-73-2, Sodium hydroxide,
 reactions 7631-99-4, Sodium nitrate, reactions 7647-01-0,
 Hydrochloric acid, reactions 7664-38-2, Phosphoric acid, reactions
 7697-37-2, Nitric acid, reactions 16872-11-0,
 Tetrafluoroboric acid 79917-90-1, 1-Butyl-3-methylimidazolium
 chloride 507468-58-8 528818-81-7, 1-Butyl-3-methylimidazolium
 hydroxide 528818-82-8, N-Methyl-N-propylpyrrolidinium
 chloride
 (use in electrochem. process for producing ionic
 liqs.)

RETABLE

Referenced Author Referenced (RAU)	Year	VOL	PG	Referenced Work (RWK)	File
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Anon					
Anon					
Anon	1995			WO 9521871	HCA
Anon	1995			WO 9521872	HCA
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Holbrey	1999	1	223	Clean Products and P	
Koch	1998			US 5827602 A	HCA
McEwen	1999			US 5965054 A	HCA
Moulton	1999			US 5951845 A	HCA
Seddon				Room-Temperature Ion	
Shimizu	1986			US 4572769 A	HCA
Shiono	1999			US 5870275 A	HCA
OS.CITING REF COUNT:	4	THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)			